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REINFORCEMENT OF CERAMIC GRINDING DISKS
WITH A STEEL ANNULAR RING

(Report and 2 plates)

P. J. Lavergne



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ABSTRACT

This paper describes the fabrication of a steel annular ring that greatly prolongs the life of the costly ceramic grinding disks used for rock pulverizing.

REINFORCEMENT OF CERAMIC GRINDING DISKS WITH A STEEL ANNULAR RING

INTRODUCTION

Extensive experience using ceramic grinding disks has shown that the lifetime of these disks is relatively short when pulverizing hard, fine-grained rocks. To prevent chipping, cracking, and splitting of these expensive ceramic disks a steel annular ring has been designed, which when properly fitted increases the resistance of the disks substantially and greatly prolongs their life.

FABRICATION OF ANNULAR RING

To fabricate and install the steel annular ring on an 8-inch diameter ceramic grinding disk (Plate I) the following steps should be carried out.

1. Cut a piece of mild steel measuring 24 inches long, 1/2 inch thick, and 1 inch wide.
2. Heat this piece of steel to 1,500°F and shape into an annular ring either in a rolling mill or if this is not available by tapping it with a hammer around an 8-inch diameter steel grinding disk.
3. Weld the ring leaving no seam.
4. Shape the annular ring on a lathe, making it perfectly circular and reducing the width to 3/4 inch, the thickness to 1/4 inch, and the inside diameter to 2/1,000 inch smaller than that of the ceramic grinding disk to which it is to be fitted.
5. Heat the annular ring to approximately 500°F.
6. Fit the hot ring over the ceramic disk such that it is flush with the back of the plate. This step is an important one and good planning is necessary to make sure that the ring is in the proper position. Once the ring has cooled attempts to adjust it, if improperly placed, may crack or otherwise damage the ceramic disk. Any overlap of the ring at the back of the disk should be removed by a lathe.
7. Slowly cool the ring to room temperature.

CONCLUSIONS

Steel annular rings properly fitted to ceramic disks greatly increases their lifetime and prevents chipping, cracking, and splitting, especially when pulverizing hard rocks. Since the steel ring is not in abrasive contact with the sample there is no risk of contamination.

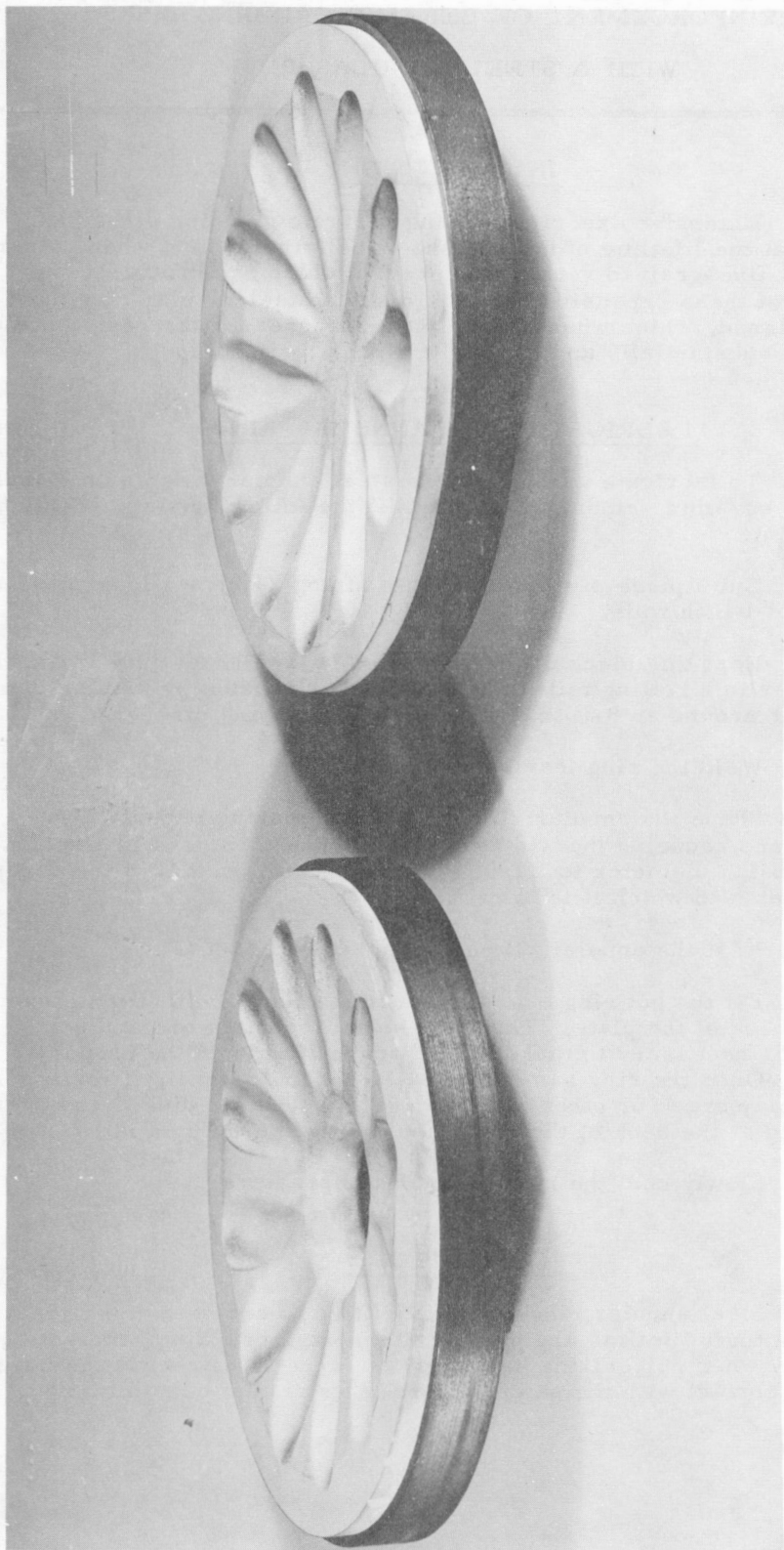


Plate I. End view of ceramic plates reinforced with steel annular ring.

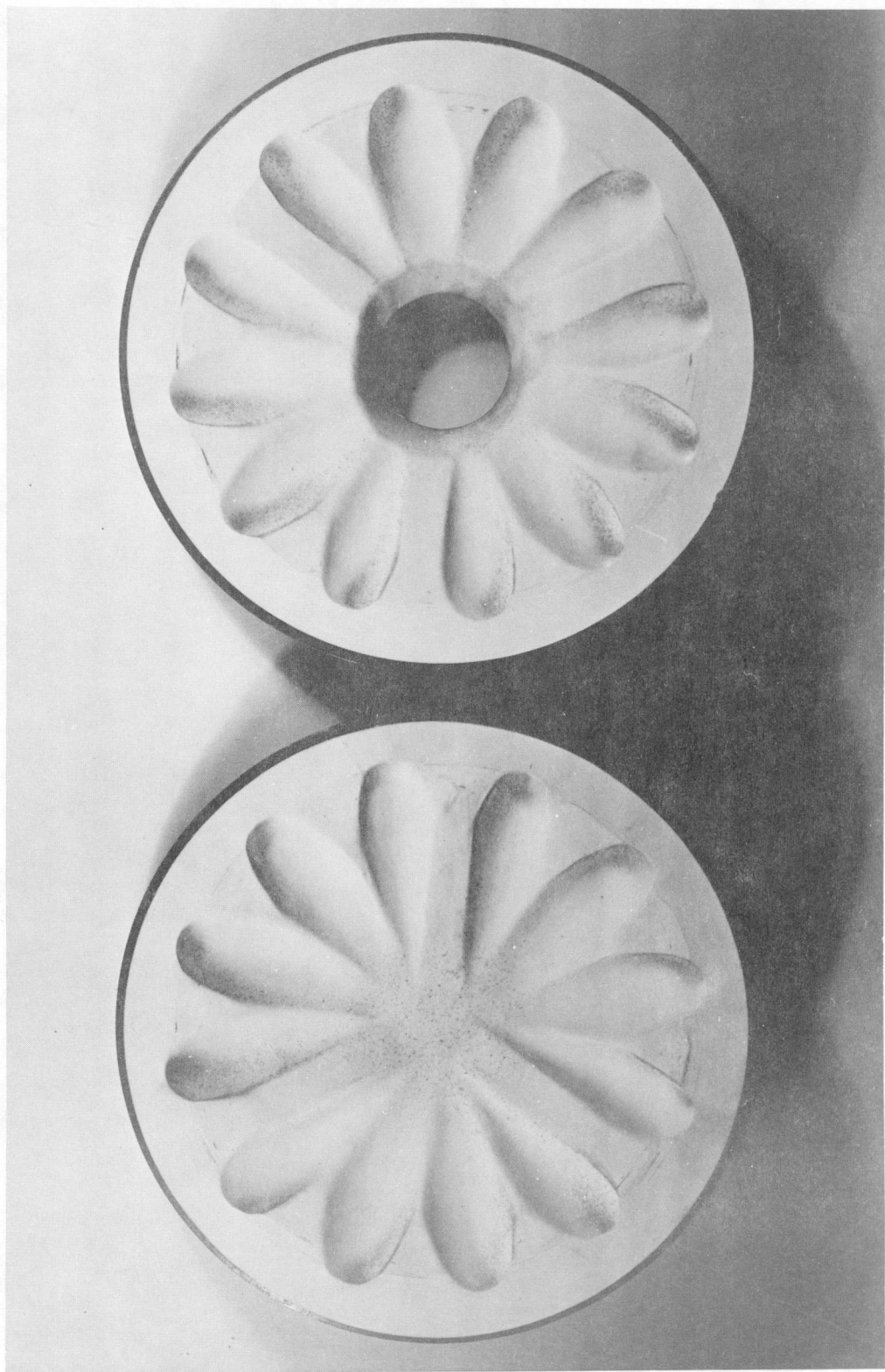


Plate II. Side view of ceramic plates reinforced with steel annular ring.